BEFORE THE OREGON WATER RESOURCES DEPARTMENT

IN THE MATTER OF AN INVESTIGATION IN AID OF DISTRIBUTION PURSUANT TO ORS 540.210	)	**DETERMINATION ON STATUS OF RELEASES FROM UPPER KLAMATH LAKE THROUGH THE LINK RIVER DAM**
Klamath Irrigation District Petitioner,	)	
Bureau of Reclamation Reservoir Owner.	)	

I. BACKGROUND

Pursuant to the order of the Marion County Circuit Court dated October 13, 2020[1] ((*Klamath Irrigation District v. Water Resources Department* (20CV15606)) and consistent with its ongoing obligation under ORS 540.210, the Oregon Water Resources Department (Department) continues to divide or distribute the water in accordance with the relative and respective rights of the various users of the Upper Klamath Lake (UKL) reservoir and to continue the work until the necessity ceases to exist.

The Department will provide an updated determination as to the status of water released from UKL whenever circumstances change materially but no less frequently than every 30 days throughout 2021. The first determination for 2021 was issued on January 22, 2021.[2] This is the second determination for 2021 (hereinafter "Determination #2).[3]

II. FINDINGS OF FACT

Findings of fact 1 – 19 from the Determination #1 are incorporated by reference and additional findings are added as follows:

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[1] The October 13, 2020 order directed the watermaster to "* * * immediately stop the distribution, use and/or release of Stored Water from the UKL [Upper Klamath Lake] without determining that the distribution, use and/or release is for a permitted purpose by users with existing water rights of record or determined claims to use the Stored Water in UKL."

[2] The DETERMINATION ON STATUS OF RELEASES FROM UPPER KLAMATH LAKE THROUGH THE LINK RIVER DAM issued on January 22, 2021 is referred to as Determination #1.

[3] This Determination #2 incorporates by reference the "Authorities" and "Background" section in the DETERMINATION ON STATUS OF RELEASES FROM UPPER KLAMATH LAKE THROUGH THE LINK RIVER DAM issued on January 22, 2021 (Determination #1).

Lake level determined claim upstream of the Link River Dam

1. The Klamath Tribes hold Determined Claim KA 622 which authorizes monthly lake levels in UKL (see Table 1) for the beneficial purpose of establishing and maintaining a healthy and productive habitat to preserve and protect the Tribes' hunting, fishing, trapping and gathering rights on former reservation land. The priority date for KA 622 is time immemorial, but pursuant to an agreement between the Klamath Project Water Users, the Klamath Tribes, the United States Bureau of Indian Affairs and the Department, this right is subordinated to August 9, 1908.

Month	Minimum Lake Levels (In feet above mean sea level)
January 1 – March 31	Consistent with flood control purposes, raise elevation as quickly as possible to 4143.0 by March 31.
April 1 – June 15	4143.0
June 16 – June 30	4142.0
July 1 – July 15	4141.5
July 16 – August 15	4140.5
August 16 – October 15	4139.5
October 16 – November 30	4140.5
December 1 – December 31	4141.0

Table 1

Authorized year-round natural flow diversions from Upper Klamath Lake

2. Claim KA 144 was originally in the name of Shamrock Holdings of California, DBA Running Y Ranch. KA 144 was submitted for a total of 77 cfs with a priority date of December 31, 1889 with the source from Upper Klamath Lake (UKL) for the irrigation of 5,572.6 acres. In April 1994, KA 144 was transferred to Jeld-Wen, Inc. In June of 2011, a portion of the property associated with KA 144 was transferred from Jeld-Wen, Inc. to RLF Running Y Ranch. This resulted in the bifurcation of KA 144 into two separate claims, being KA 144 and KA 734. KA 144 has one point of diversion for a total of 43.51 cfs for the year-round irrigation of 3,480.6 acres and a year-round livestock use of 0.052 cfs. The point of diversion is located at T38S R8E Sec 7 SENW lot 5.

3. Claim KA 734 in the name of Jeld-Wen, Inc. and Caledonia Properties LLC for the irrigation of 2088.9 acres with a priority date of December 31, 1889. The season of use is year-round, and the source is UKL. There are three points of diversion for a total of 25.81 cfs and 0.031 for livestock watering. POD #1 is located at T37S, R8E, NENW section 32 (14.93 cfs); POD #2 is located at T37S, R8E, SESE section 29 (5.00 cfs); and POD #3 is located at T38S, R8E, SENW section 7 (5.88 cfs).

4. Claim KA 143 in the name of Marta Carpenter is for the irrigation of 439.0 acres with a priority date of December 31, 1889 and irrigation of 58.9 acres with a priority date of December 31, 1907. Additionally, this claim allows for the use of 6,000 gallons per day for livestock watering.

The total diversion rate is 8.47 cfs at a POD location of T38S, R8E, SWNW of section 14 on government lot 2. The season of use is year-round, and source of water is UKL.

5. Claim KA 160 in the name of Jeld-Wen, Inc. for the purpose of maintenance of a fire suppression system and industrial use with a priority date of December 31, 1905. The allowed rates are 13.13 cfs for the maintenance of a fire suppression system and 0.15 cfs for industrial use. The source of water is Upper Klamath Lake and wastewater for year-round use. The POD is located at T38S, R9E, NENW section 19 on government lot 6.

Stored water in Upper Klamath Lake

The following findings of fact are based on the best available information as of the date of this Determination #2.

6. The equation the Department is using to calculate stored water releases is:

$$\textit{\{eqn 1\} Storage Release} = \textit{Link River Flow} - (\textit{UKL Inflows} - \textit{UKL Diversions}_{KA1000})$$

with the storage release in excess of water rights then calculated as:

$$\textit{\{eqn 2\} Excessive Storage Release} = \textit{Storage Release} - \textit{Downstream Diversion}_{KA1000}$$

If either equation results in a negative value, then no storage release unrelated to water rights is occurring.

Description of the variables used in the equation:

Link River flow data are available from a USGS stream gage (USGS 11507500) operated on the river.

UKL inflows represent the total amount of *natural flow* coming into the lake from surface water, groundwater, and precipitation. Some of these inflows are measured directly (e.g., Wood and Williamson River stream gages) while others must be estimated (e.g., groundwater inflows) as explained below.

UKL Diversions$_{KA1000}$: The largest UKL Diversion, the A Canal, is monitored by a gage accessible at this link: https://www.usbr.gov/pn-bin/wyreport.pl?site=acho&parameter=qj&head=yes.
Thirty smaller diversions with diversion rates of one cfs or greater also divert from UKL above the Link River Dam. Because he majority of these points of diversion do not have measuring devices installed, their diversion rates are estimated using the authorized diversion rate on the determined claim or water right.[4]

[4] Efforts are underway to develop a more sophisticated mechanism of estimating these numerous smaller users that divert water directly from Upper Klamath Lake, including inventorying each POD and working with the landowner to install measuring devices.

Downstream Diversions$_{KA1000}$: Gages monitor three of the KA 1000 diversions below UKL; the Lost River Diversion Canal (LRDC), the North Canal, and the Ady Canal. There are approximately 12 additional diversions identified under the KA 1000 below the Link River Dam and approximately 50 other diversions from the Klamath River downstream of the Link River Dam not associated with KA 1000. The smaller diversions and individual pump diversions are currently estimated (see footnote 4). Currently no water is being diverted by these smaller users.

7. Table 2 represents the Department's calculations of inflows into Upper Klamath Lake versus lake outflows for the time period between January 23, 2021 and February 21, 2021

ATTORNEY CLIENT PRIVILEGE AND WORK PRODUCT

DATE	Lake Elevations (FT) and Storage (AC-FT)					Lake Inflows (CFS)			Lake Outflows (CFS)					Flow Distribution Calculation						
	UKL Lake Elevation (USBRKB Datum)	UKL Elevation > 4136 FT (USBRKB datum)	UKL Storage	Stored since Jan 1, 2021	KLA 294 Remaining to Store (Max 486,828 AF)	Gaged Inflows into UKL	Ungaged Inflows into UKL	Precip	Evap	Link River Flow	A- Canal Diversion	KA 1000 Diversions from Adjacent UKL Lands	Non KA 1000 Diversions from Adjacent UKL Lands	Live Flow Available to Pass Link R Dam	Stored Water Released from Link R Dam	Gaged KA 1000 below LRD	Ungaged KA 1000 below LRD	Non KA 1000 Diversions below LRD	KA 1000 Storage Deliveries blw LRD	Stored Release in Excess of WRs
1/23/2021	4139.82	3.82	261,977	41,898	223,048	979	288	0	58	588	0			1267	0	182.8			0	0
1/24/2021	4139.82	3.82	261,977	41,949	222,997	989	288	57	26	658	0			1334	0	182.4			0	0
1/25/2021	4139.83	3.83	262,730	42,804	222,142	981	288	0	51	893	0			1269	0	194.2			0	0
1/26/2021	4139.81	3.81	261,224	41,374	223,572	883	288	170	38	857	0			1341	0	221.2			0	0
1/27/2021	4139.82	3.82	261,977	42,330	222,616	941	288	0	103	699	0			1229	0	225.2			0	0
1/28/2021	4139.87	3.87	265,747	46,177	218,769	982	288	228	39	599	0			1497	0	225			0	0
1/29/2021	4139.89	3.89	267,263	47,769	217,177	1016	288	100	39	611	0			1403	0	206			0	0
1/30/2021	4139.90	3.9	268,021	48,692	216,254	971	288	14	83	623	0			1273	0	199.4			0	0
1/31/2021	4139.91	3.91	268,779	49,629	215,317	976	288	0	90	645	0			1264	0	204.1			0	0
2/1/2021	4139.89	3.89	267,263	48,524	216,422	974	288	128	208	651	0			1390	0	105.6			0	0
2/2/2021	4139.95	3.95	271,810	53,259	211,687	988	288	14	94	627	0			1290	0	16.66			0	0
2/3/2021	4139.98	3.98	274,088	55,686	209,260	1004	288	213	75	553	0			1505	0	16.27			0	0
2/4/2021	4140.00	4	275,608	57,319	207,627	984	288	14	57	520	0			1286	0	18.46			0	0
2/5/2021	4140.00	4	275,608	57,506	207,440	979	288	0	94	505	0			1267	0	15.15			0	0
2/6/2021	4140.02	4.02	277,128	59,294	205,652	965	288	0	135	492	0			1253	0	11.71			0	0
2/7/2021	4140.04	4.04	278,648	61,160	203,786	954	288	0	174	643	0			1242	0	11.85			0	0
2/8/2021	4140.05	4.05	279,408	62,208	202,738	976	288	0	145	745	0			1264	0	13.5			0	0
2/9/2021	4140.07	4.07	280,938	63,968	200,978	964	288	0	116	749	0			1252	0	15.56			0	0
2/10/2021	4140.08	4.08	281,707	64,967	199,979	948	288	0	116	702	0			1236	0	17.59			0	0
2/11/2021	4140.09	4.09	282,477	65,833	199,113	980	288	613	48	585	0			1880	0	16.6			0	0
2/12/2021	4140.12	4.12	284,786	68,296	196,650	983	288	233	77	556	0			1504	0	13.28			0	0
2/13/2021	4140.15	4.15	287,095	70,796	194,150	1069	288	452	97	563	0			1809	0	8.63			0	0
2/14/2021	4140.19	4.19	290,193	74,010	190,936	1017	288	380	58	557	0			1685	0	13.65			0	0
2/15/2021	4140.20	4.2	290,968	74,996	189,950	1125	288	614	107	548	0			2026	0	10.66			0	0
2/16/2021	4140.27	4.27	296,407	80,666	184,280	1097	288	15	116	512	0			1399	0	13.08			0	0
2/17/2021	4140.29	4.29	297,973	82,462	182,484	1050	288	0	116	445	0			1338	0	19.17			0	0
2/18/2021	4140.31	4.31	299,539	84,105	180,841	339	288	1358	39	413	0			1985	0	11.42			0	0
2/19/2021	4140.37	4.37	304,245	89,003	175,943	355	288	219	97	411	0			862	0	18.48			0	0
2/20/2021	4140.40	4.4	306,618	91,607	173,339	353	288	15	116	422	0			655	0	14.03			0	0
2/21/2021	4140.42	4.42	308,201	93,382	171,564	342	288	15	97	431	0			644	0	16.16			0	0

Table 2

8. To manage the water rights and determined claims and distinguish between natural flow and stored water, the Department must quantify gross inflows to UKL. Stream tributaries constitute one component of UKL inflows and include the Williamson River, Wood River, Sevenmile Creek, Crystal Creek, Thomason Creek, and Fourmile Creek. These streams and their tributaries are listed as sources on KA 294. Gaged inflow streams include the Williamson and Wood Rivers, and Sevenmile Creek. The Department is working with the Bureau to evaluate the viability of installing gages on Crystal Creek and Fourmile Creek. The following table (Table 3) contains measured inflows between January 23, 2021 and February 21, 2021. Table 3 also includes estimates of the ungaged inflows into UKL, including groundwater contributions. Direct precipitation into the UKL is also included in the table. Groundwater contributions are based on USGS estimates and adjusted for current hydro-climate conditions. The daily ungaged inflows estimate is based on the previous month's lake water balance, which is subsequently adjusted based on reconciliation with the current monitoring period UKL water balance (explained below). Table 3 is as follows:

Upper Klamath Lake Inflows (CFS)									
DATE	USGS Gage 11504115 Wood River	USGS Gage 11504290 Sevenmile at Dike Rd	USGS Gage 11502500 Williamson	GW Inflow Estimate	Fourmile, Crystal Creek & Other Ungaged Tributaries	Gaged Inflows to UKL	UnGaged Inflows to UKL	Precipitation	Total Inflow to UKL
1/23/2021	361	80	538	240	48	979	288	0	1270
1/24/2021	356	90	543	240	48	989	288	57	1280
1/25/2021	356	80	545	240	48	981	288	0	1270
1/26/2021	325	30	528	240	48	883	288	170	1170
1/27/2021	344	100	497	240	48	941	288	0	1230
1/28/2021	356	90	536	240	48	982	288	228	1270
1/29/2021	350	70	596	240	48	1016	288	100	1300
1/30/2021	339	70	562	240	48	971	288	14	1260
1/31/2021	344	90	542	240	48	976	288	0	1260
2/1/2021	349	80	545	240	48	974	288	128	1260
2/2/2021	351	90	547	240	48	988	288	14	1280
2/3/2021	355	100	549	240	48	1004	288	213	1290
2/4/2021	348	90	546	240	48	984	288	14	1270
2/5/2021	348	80	551	240	48	979	288	0	1270
2/6/2021	350	80	535	240	48	965	288	0	1250
2/7/2021	341	80	533	240	48	954	288	0	1240
2/8/2021	345	90	541	240	48	976	288	0	1260
2/9/2021	344	80	540	240	48	964	288	0	1250
2/10/2021	342	70	536	240	48	948	288	0	1240
2/11/2021	345	90	545	240	48	980	288	613	1270
2/12/2021	344	90	549	240	48	983	288	233	1270
2/13/2021	357	160	552	240	48	1069	288	452	1360
2/14/2021	346	120	551	240	48	1017	288	380	1300
2/15/2021	356	200	569	240	48	1125	288	614	1410
2/16/2021	363	172	562	240	48	1097	288	15	1380
2/17/2021	349	140	561	240	48	1050	288	0	1340
2/18/2021	339	96.3	571	240	48	1006.3	288	1358	1290
2/19/2021	355	109	568	240	48	1032	288	219	1320
2/20/2021	353	120	555	240	48	1028	288	15	1320
2/21/2021	342	101	556	240	48	999	288	15	1290

Table 3 ***Note: OWRD gages were located and installed to monitor instream determined claims**.*

9. The total UKL inflow estimate is reconciled against the change in UKL contents and the outflows based on a water balance of the lake performed periodically, expressed as the following equation:

{eqn 2} Reconciled UKL Inflows = Change in UKL Contents + UKL outflows

Adjustments to the estimated ungaged inflow components are made based on this reconciliation to ensure the UKL water balance is satisfied.

Description of the variables used in the equation:

The **change in UKL contents** is based on contents derived from the USBR elevation capacity table using the average UKL elevation from four USGS lake level gages.

UKL outflows consist of lake evaporation, outflows through the Link River and A- Canal, and 30 other miscellaneous diversions directly from the UKL. Lake evaporation is currently estimated using weather station data from two nearby AgriMet sites. Flow through the Link River and A- Canal are measured with stream gages. The other miscellaneous diversions from the lake are currently estimated.

10. Evaporation from UKL reduces the amount of stored water available under determined claim KA 294. Water stored in UKL is subject to evaporation from the lake surface and during certain times of the year and can equal hundreds of cubic feet per second. Because the rate of evaporation from UKL can be so large during the hot summer months, it is important to reduce the uncertainty in this estimate. The Department is working with the Bureau to evaluate monitoring and recording instruments to improve measurement of evaporation from UKL. For the purpose of this determination, evaporation is estimated by a Penman-Monteith equation that uses weather data from two USBR AgriMet weather stations just north and south of UKL. Evaporation estimates are adjusted for local lake conditions based on comparisons of the Penman-Montieth derived estimates with concurrent evaporation data on UKL from a study completed by USBR in 2015. These estimates are subject to change as better data become available. The evaporation estimate is charged against the storage account, thus increasing the accounting of what has been stored since the beginning of the year, and decreasing the amount remaining to be stored under the 486,828 acre-foot storage cap in KA 294.

11. At this time, the total gaged inflows plus the estimated groundwater inflow to UKL exceeds the amount of water passing through the Link River Dam. Therefore, the water passing through Link River Dam is natural flow as opposed to Legally Stored Water (Table 4.)

Water Balance Summary Table

Start Date		1/23/2021
End Date		2/21/2021
Number of Days in Reporting Period		29
	AC-FT	*Equivalent CFS*
Change in Storage (+ = storage	46,224	*804*
Gaged Inflows	57214	*995*
Ungaged Inflows [1]	2,770	*48*
Groundwater Inflow[2]	13781	*240*
Precipitation Inflow	9302	*162*
Total Inflow	83068	*1444*
Evaporation	-2710	*-47*
Link River Outflow	-34135	*-593*
A Canal Diversions	0	*0*
Adjunct UKL Land Diversions	0	*0*
Total Outflow	-36844	*-641*
UKL Water Balance	0	0
[1] Adjusted to close water balance		
[2] Updated from Hubbard using Spring Cr as hydro-climate index		

Table 4

III. ULTIMATE FINDINGS OF FACT

1. As of the date of this determination, water is being stored in UKL and inflows into the UKL exceed outflows such that water passing through the Link River Dam does not constitute the release of Legally Stored Water but constitutes release of natural flow.

2. As of the date of this determination, the KDD and ADY District Improvement Company may divert up to 200 cfs through the North Canal structure and up to 400 cfs through the ADY Intake Control structure (up to a total of 28,910 AF from November 1 – February 28) of water from the Klamath River at points of diversion downstream of the Link River Dam. The water diverted constitutes "live flow" as opposed to stored water.

3. PacifiCorp may generate power from water passing through the Link River Dam at JC Boyle as the Eastside and Westside hydro rights are currently leased instream at Link River Dam.

4. As of the date of this determination, KA 734, KA 143, KA 144, and KA 160 may appropriate water from UKL for irrigation at points of diversion upstream of the Link River Dam.

5. As of the date of this determination, the elevation of Upper Klamath Lake may be raised to 4143.0 pursuant to KA 622 insofar as water is available following satisfaction KA 294.

IV. CONCLUSIONS

1. The water passing the Link River Dam is natural flow and does not constitute water waste.

2. No Legally Stored Water is presently passing through the Link River Dam.

V. DETERMINATION

As of the date of this Determination #2, water passing through the Link River dam is natural flow comprising water in excess of the needs of water users and flow in excess of inflows. Because no stored water is being released through the Link River Dam, the Watermaster District 17 may not order the cessation of release of this water.

The Department and Watermaster District 17 will continue to monitor conditions in the Upper Klamath Lake throughout 2021, or until such time as the necessity therefore shall cease to exist and will issue a status determination on a monthly basis or as conditions change. When the Department determines that Legally Stored Water is passing through the Link River Dam, it will issue an order directed to the Bureau with respect to Legally Stored Water being released by passing through the Link River Dam.

DATED this 23rd day of February 2021.

DANETTE WATSON,
Watermaster, District 17
Oregon Water Resources Department